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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 12, 1966



Paraseeds

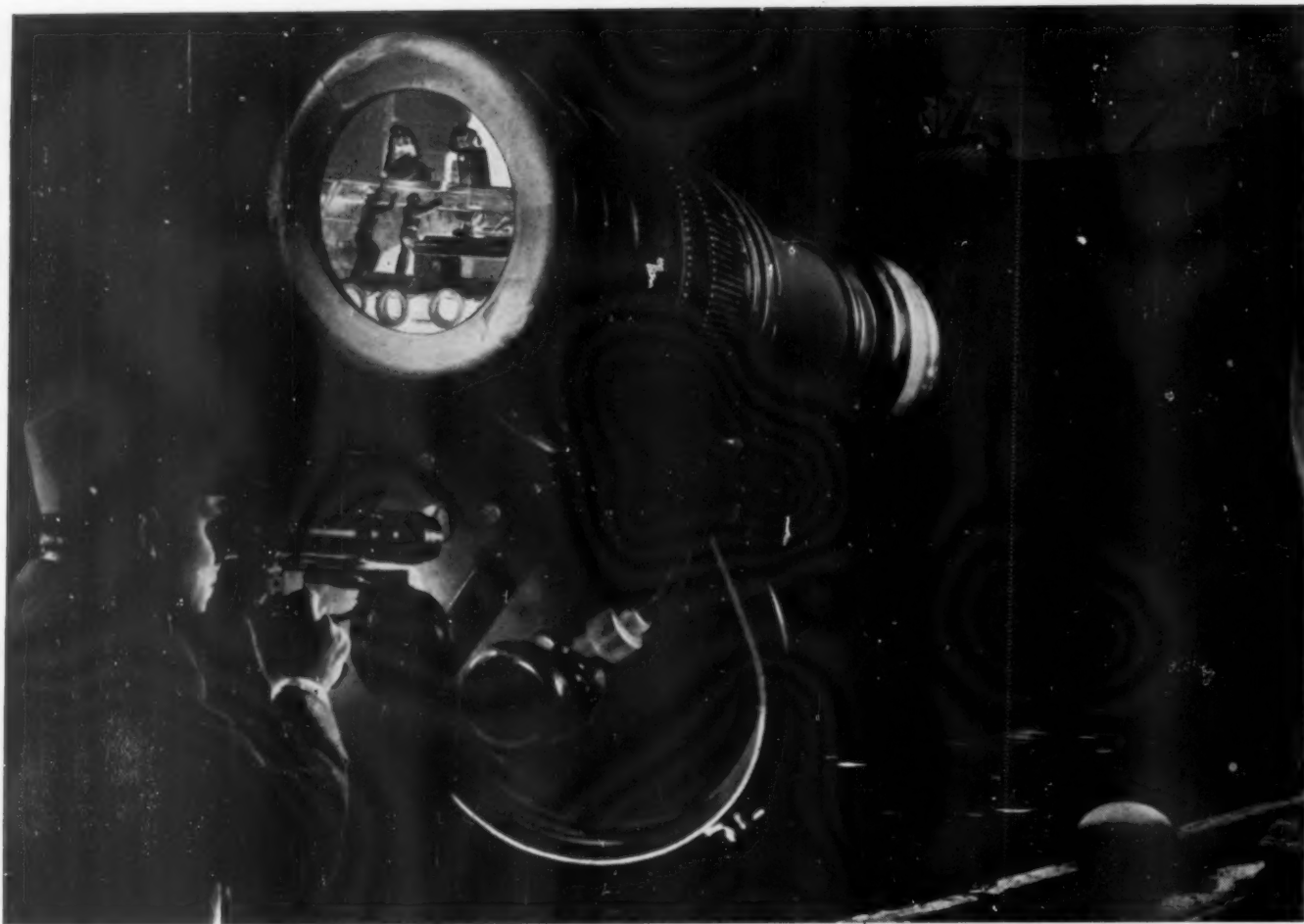
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A SCIENCE SERVICE PUBLICATION

1971

TWENTY-FIFTH ANNIVERSARY

1941



Robbery at the waterfront—detected and observed in total darkness through the amazing infrared ray "snooperscope."

"Snooperscope"--sees at night with invisible light!

Crime detection is one of the many uses for this uncanny telescope that can distinguish objects more than several hundred yards away in a complete blackout.

The sniperscope and snooperscope are two wartime developments of RCA Laboratories in co-operation with the U. S. Army which are now being converted to civilian, industrial and police uses.

These instruments were made possible through a tiny image tube less than two inches in diameter and less than five inches long. Adapted to various military equipment, these telescopes provided the Army with some of its best night-fighting

devices. A helmet-mounted binocular employing these image tubes enabled scout cars to speed over roads at 40 to 50 miles an hour without lights.

The same engineering skill that produced the snooperscope is reflected in every RCA and RCA Victor product—whether it is a Victrola* radio-phonograph, made exclusively by RCA Victor, or a television receiver, or a radio tube. If it's an RCA, it is one of the finest instruments of its kind science has achieved.

Radio Corporation of America, RCA Building, Radio City, New York 20. Listen to The RCA Victor Show, Sundays, 2:00 P. M., Eastern Standard Time, over NBC Network.



The "Sniperscope." Here our infrared telescope is mounted on a carbine. The combination was aptly called a "sniperscope" for it enabled a soldier in total darkness to hit a target the size of a man at 75 yards. Thirty per cent of the Japanese casualties during the first three weeks of the Okinawa campaign were attributed by the Army to this amazing sniperscope.



RADIO CORPORATION of AMERICA

*Victrola T. M. Reg. U. S. Pat. Off.

MEDICINE

Cancer Cells Are Tough

Death of normal cells in a given spot, and their replacement by "outlaw" cells, may be a cause of cancer. Cancer cells are malignant, multiplying rapidly.

► **CANCER CELLS** are a survival of the toughest. This view was presented by Dr. C. P. Rhoads, director of the Memorial Hospital, New York, before the closing session of the conference on the chemistry and physiology of growth held as a part of the bicentennial celebration of Princeton University.

One of the ways in which cancer may arise, Dr. Rhoads suggested, may be the death of all normally constituted cells in a given spot under the impact of physiologically impossible conditions such as prolonged irritation or harmful chemicals.

In the same area may be some cells that have departed from normal—become biological outlaws, so to speak. With the respectable citizens of the cellular community all dead, the outlaw cells have their chance and set up their own anarchic state, which then begins a career of aggression along its frontiers.

Dr. Rhoads stressed particularly the definite malignant character of cancer

cells, as well as their more rapid rate of multiplication. The rather generally accepted idea of a cancer being the result of essentially normal cells that for some reason simply reproduce too rapidly, is in his opinion inadequate. Cancer cells differ from normal cells qualitatively as well as quantitatively. They are bad as well as numerous and prolific.

This picture of cancer cells as outlaw survivors of a local biological catastrophe is by no means necessarily the only possible one, Dr. Rhoads made clear. Other factors may be taken into consideration also, especially the possible changes in the hereditary character of cells, either spontaneous or in response to external chemical or physical attack. He emphasized, finally, the need for a great deal more data on the composition of cells, both normal and cancerous. Among the research tools that may be used in these studies are radioactive tracer elements produced by atomic fission.

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MEDICINE

Lung Cancer Increases

Majority of victims live in cities, which points to dust and dirt as contributing causes. Stomach cancer is still commonest of cancers.

► **CANCER** of the lungs seems to be increasing, Dr. William F. Rienhoff, Jr., of John Hopkins University, announced at the centennial celebration of the University of Buffalo.

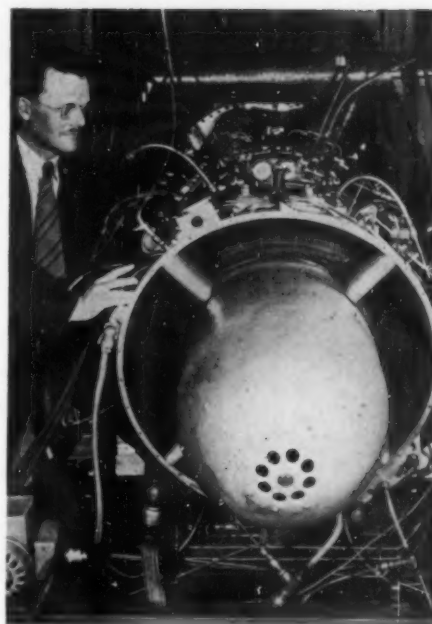
The great majority of patients with this cancer live in cities, which points to dust, dirt, fumes, gases and other atmospheric pollutions as the irritating factors that cause lung cancer.

Cancer of the lung can be satisfactorily treated by surgical removal of the entire lung but the disease is fatal unless so treated, Dr. Rienhoff declared. He reported one patient still alive and well who had this operation 13 years ago. Twelve patients have lived five or more years, one for 11 years, two for nine years

and two for six years.

"As they are still living there is a possibility that they may live for many years," Dr. Rienhoff stated. "All these patients except one who was a professional boxer have been restored to their normal activities. They have been able to return to their former vocations and even recreations, such as golf, swimming, fishing and hunting. No deformity is visible. The remaining lung expands to fill the dead space in the chest."

Of 107 patients operated on between 1933 and 1946, there were 25 hospital deaths. The death rate for the operation was 27% up to 1940. Since then it has dropped to 22% and Dr. Rienhoff foresees still further improvement as meth-



JET POWER—New axial-flow turbojet engine, the TG-180, developed by General Electric, powers the Army XP-84 Thunderbolt, speed-breaker at 611 miles per hour.

ods of anesthesia and chemo-therapy to fight infection are improved.

Doctors and lay public, Dr. Rienhoff stressed, must learn the early symptoms of lung cancer so that patients can get the benefit of the operation that is their only hope of survival.

Cough was the chief symptom in almost three-fourths of the patients. In a nation of heavy cigaret smokers, cough is almost universal, Dr. Rienhoff pointed out. The thing to watch out for is a change in the type of cough.

Lung cancer may be increasing, but stomach cancer is now the commonest of all cancers, Dr. Owen H. Wangansteen of the University of Minnesota declared.

Stomach cancer is curable, but the problem is to recognize the disease in time so that the patient will not be denied the real hope that timely and well-performed surgery holds out, he said.

At present, only one-fourth of patients who are diagnosed as having stomach cancer are suitable candidates for operation and 92 to 98 out of every 100 will die of the disease within five years.

"Go to your doctor and be examined three or four times a year. Women over 40 and men past 50 should report regularly," is Dr. Wangansteen's advice to the public anxious to escape stomach cancer death.

To physicians he advised a less conservative attitude toward stomach ulcers



"GUINEA PIG"—Monkeys such as these, photographed at the zoo in Washington, D. C., may help future infantile paralysis victims. The cynomolgus monkey is more like humans in the way it gets polio than any other monkey or other animal, and a hunt across the Pacific to get this species is in progress.

which may turn into cancer. Some ulcers may be cancer when first diagnosed as harmless ulcers, he warned. The operation to remove stomach ulcers can be done with a risk well below five percent, he declared.

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MEDICINE

Penicillin Spraying Helps Fight Coughs, Influenza

► **MANY** a patient will be spraying penicillin into his lungs with a hand atomizer this winter to fight coughs, influenza and pneumonia, if physicians generally follow the method found successful last winter by Dr. Frank W. Morse of Lawrencetown, Nova Scotia.

Writing as a "general practitioner for other general practitioners," Dr. Morse tells in the *Journal of the American Medical Association* (Oct. 5) how he used penicillin in this way with good results in 24 out of 26 cases.

Chief drawback to the use of the life-saving drug in a country practice, he points out, is that to give it by injection into muscles or veins requires putting the patient in a hospital or having two nurses for each patient. Good results in inhalations of penicillin aerosol, the penicillin being converted into a fine spray by a power-operated atomizer, had previously been reported by a number of

other scientists. Dr. Morse decided to try the familiar hand atomizers which he could carry in his bag and leave with his patients for them to use between his visits.

Small cost; pleasant taste of the penicillin; soothing effect on dry, irritated membranes of the throat; and relief of cough as well as remedial effect in fighting disease germs in throat and lungs are among the advantages given for the method by Dr. Morse.

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ZOOLOGY

Female Baby Panda To Live at New York Zoo

► **ACROSS** the inland mountains of China to Shanghai, a female baby panda is on its way to the New York Zoological Park to be a companion for "Pandah," Mme. Chiang Kai-shek's gift to the children of America.

Until she grows a little, the new panda, weighing but 68 pounds, will be no match for six-year old, 315-pound "Pandah." Former playmate, "Pandee," the so-called male, was found to be a female when she died last October.

The baby panda is a gift to the United States from General Chang Chun, governor of the province of Szechwan, where she was captured.

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SAFETY

Inert Gases Found To Be Good Fire Fighters

► **CARBON-DIOXIDE** has been the principal inert gas used in fire extinguishers in the past, and probably will be more extensively used in the future. However, other inert gases have been found to be more effective in certain applications. The U. S. Civil Aeronautics Board recommends the use of methyl bromide and carbon tetrachloride on aircraft. The U. S. Bureau of Mines finds that Freon 11 is effective in gasoline fires, more effective than other gases tested.

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PHYSICS

Tracking Rockets In Flight

Radio waves from very high frequency station rebroadcast by radio set carried in the rocket help track stratosphere rockets throughout their flight.

► STRATOSPHERE rockets can be tracked throughout their flight, no matter how far or how fast they go, by a method disclosed at the Army Ordnance Society's first postwar day at Aberdeen, Md.

Radio, not radar, is the means employed. As the rocket is launched a very high frequency station starts sending waves of 38.5 million per second frequency. These are picked up by a radio set carried in the rocket and rebroadcast at double frequency (70 million per second).

The returning waves are set "off beat" by the rocket's increasing distance from the starting point in what physicists know as the Doppler effect. By measuring this, observers can tell where their giant missile is to as close as six feet.

Ordnance officers also have a more direct way to keep track of rockets up to moderate distances. An optical device that has been nicknamed "Little Bright-Eyes" is able to fill one-third of a standard motion picture frame with the image of a V-2 rocket in flight at 30 miles.

Although guided missiles may carry "city-busting" atom bombs if war comes

again, Army men still expect a lot of tough combat at lower levels—right down in the mud where all wars have always ended, however they may have started. To help the GI, Ordnance men are doing all they can to build up his fire power.

The individual rifle has now been turned into a potential machine gun. A Garand rifle was demonstrated that can switch its rate of fire from one at a time to full automatic, loosing a whole clip of 30 cartridges at one pull of the trigger.

The infantry man is also being given his own heavy artillery weapons of up to six-inch caliber that he can carry right up into the forward fighting areas. Light weight mortars of 155-millimeter caliber were fired during the demonstration as well as recoilless 105-millimeter cannon. Both are much more powerful than the World War II weapons which they replace. The new bazooka has a caliber of 3.5 inches as against the original model's 2.36 inches. A bazooka projectile of that size should be able to knock out any known tank.

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BOTANY

'Paraseeds' Fly Far

Many plant species send offspring through air to seek their fortune. The milkweed seed, carried by the wind, typify this mode of dispersal.

See Front Cover

► "PARASEEDS," well exemplified by those of the common milkweed, were prototypes of paratroopers long before man mastered the art of flight. Like paratroopers, they have a definite mission to perform—not the destruction of enemies but the dissemination and propagation of their own species of plant. And like paratroopers, they must preferably carry out their mission at a distance from the main body. Silk-borne seeds of milkweed are shown on the cover of this SCIENCE NEWS LETTER.

The plants that make use of para-

chutes of silky filaments to carry their seeds are astonishing in their variety and the wide diversity of their botanical kinships. Among the groups having airborne seeds of this particular type are milkweeds, dandelions and their cousins the thistles and lettuces, fireweeds, poplars, willows and the so-called air-plants of the tropics and subtropics, of which the Spanish moss of our own South is the most familiar example.

Like their human imitators, these parachute-borne seeds start from a high vantage-point. It may be only the six-inch scape of the dandelion, or it may be the three-foot stalk of milkweed or

fireweed, or even the 80-foot crown of a cottonwood tree. Here, though, the parallel between plant and human fails; for paratroopers really want to stay as close together as possible when they land, and the whole objective of paraseeds is the widest possible dispersal.

The parallel becomes good again, however, in another respect: like paratroopers, paraseeds—at least in some species—rid themselves of their silken canopies when they have made their landings. Thus it happens that you often see milkweed down drifting along the wind with the seed no longer attached.

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PHOTOGRAPHY

Super-Photo Finish Shows Whole Progress of Race

► PHOTO FINISHES are nothing new to race track fans—that method for settling disputed finishes of close races has been in use for quite a while. But now comes a super-photo finish technique, that will get pictures not only of the end of the race but of its whole progress from start to finish—motion pictures at that. It is intended not only to record those win-by-a-whisker finishes but to catch any fouls that may be committed, intentionally or otherwise, as the jockeys fight it out for favorable positions.

The method is the invention of Edward Nassour of Los Angeles who has received U. S. patent 2,408,528 on his idea. His plan calls for setting up electrically driven motion-picture cameras on overhanging bracketed stands, at intervals all the way around the track. In the center of the track an observer's tower is to be set up, with a pair of powerful binoculars on a pivoted mount. A projecting arm from the base of the pivot makes electrical contact with a circle of discs, as the operator swings the binoculars to follow the running horses, thus setting the cameras going in succession, as the horses approach them. The cameras are supposed to be started and stopped in overlapping succession, so as to leave no gaps in the record.

While the inventor describes his system as applied to horse-racing tracks only, it could obviously be used elsewhere if desired; for example, in track events, dog races, or any other action that involves speeding around a circular or elliptical course. Coaches could also use it in demonstrating to their men faults which they desire to correct.

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PHYSIOLOGY

Labs Feel Meat Shortage

► PRESENT paralysis of the meat industry is being felt in scientists' laboratories as well as in housewives' kitchens. Prof. Herbert Evans, of the University of California, told the conference on chemistry and physiology of growth at Princeton University that his source of raw glands in this country has been cut off, and that he is having to request fresh supplies from the slaughter-houses of Australia and New Zealand, for his work on the growth hormone.

The growth hormone, which Dr. C. H. Li, in conjunction with Prof. Evans, has succeeded in extracting from these tiny glands in the form of a pure, water-soluble crystalline protein, is the ruling substance in body growth. Rats that have been surgically deprived of their pituitaries stop growing, but when a solution containing ten millionths of a gram of the hormone is injected into them, they resume growth and eventually become giants.

There is a limit to their giantism, however. Prof. Evans stated: "I can get rats to grow almost as big as guinea pigs but not as big as rabbits."

Human giants on an equivalent scale would be about nine feet tall.

The growth hormone might be used to produce normal stature in children who fail to grow because something has gone wrong with their pituitaries if only there were enough of it. There is no present hope of getting enough, however, for even a dwarfish child would require doses very much larger than those effective in rats.

Sole present source is the pituitary gland of beef cattle. This gland, a very small object buried under the brain, is so tiny that it takes 400 or 500 of them to weigh a pound. And there is so little hormone in each gland that it takes 30,000 to yield one ounce.

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CHEMISTRY

Germ Warfare Dividends

► THE ARMY is not putting all the national defense eggs into the atom bomb basket.

The search for new weapons in germ and gas warfare is continuing, Maj. Gen. Alden H. Waitt, chief of the chemical warfare service, declared at the meeting of the District of Columbia Medical Society.

While doctors hope that atomic bomb by-products will help fight disease in the future, life-saving peacetime dividends have already been paid on the chemical corps' investment in national defense research.

A cure for mercury and arsenic poisonings; control of the dreaded cattle plague, rinderpest; improved toxoid to fight botulinus poisoning in food; hope for a cure of cancerous diseases of the blood through nitrogen mustard gases; hope for better treatment of blinding glaucoma and the muscle weakness disease, myasthenia gravis, through other chemical warfare agents; control of weeds through the search for chemicals to destroy the Japanese rice crop are among the dividends Gen. Waitt reported.

Germ weapons, he believes, have possibilities comparable to the atomic bomb in war. He said that it is a great dis-

service to national defense to say that germ warfare is not practical.

Only through science, he declared, can we reach the unity of mankind necessary to win the peace. But basic research in biological and chemical warfare must continue both as preparation for a possible next war and for the life-saving dividends this research can pay in peace.

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TELEVISION

Homes Soon May Have Color Television

► COLOR TELEVISION will be available soon for American homes, it was indicated at the National Electronics Conference in Chicago. An up-to-date report on the latest state of the art was presented by a Columbia Broadcasting System scientist, P. C. Goldmark, and studio equipment under production was described by a Westinghouse engineer, D. L. Balthis.

The equipment, which Westinghouse is now making, consists of the electrical and optical apparatus required to convert a 35-millimeter color slide, or a 16-millimeter colored film and its asso-

ciated sound, into signals suitable for an ultra-high-frequency color television transmitter.

The principles of color operation used in the equipment are based on the use of three primary colors. Mr. Balthis of Westinghouse traced the development of the composite television signal through the system, and explained how the sound and picture signals are transmitted on the same carrier frequency.

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WILDLIFE

Insecticide Ingredient Returns as Fish Killer

► DERRIS, much-used insecticide ingredient, is put back to work at its original job as a fish poison by H. R. Siegler and H. W. Pillsbury of the New Hampshire Fish and Game Department. They use it in clearing ponds of undesirable fish species before restocking with trout or other valuable game fish.

Derris was first brought to the attention of white men when European explorers found natives of the East Indies using the ground-up plants as an easy means for catching fish. Its value in killing insects was a subsequent discovery.

Messrs. Siegler and Pillsbury present a detailed account of their methods in the *Journal of Wildlife Management* (Oct.).

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ENGINEERING

Long, Slender Tubes Give Lighting Efficiency

► LONG slender tubes are used for fluorescent lamps because they give from five to seven times as much light for the electrical wattage used as short, fat tubes, the Illuminating Engineering Society was told by E. F. Lowry, W. S. Frohock and George A. Meyers ofsylvania Electric Products, Inc.

The long shape has many advantages, they said. One of the most important is "that the useful wattage in the fluorescent lamp becomes an increasingly greater percentage of the total as the length of the lamp is increased."

The efficiency of a fluorescent lamp is modified by the auxiliary equipment with which it is associated, they explained. The overall efficiency of a lamp with the conventional ballast and starter is higher, they declared, than when a "shock" type instant start ballast is used.

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Device Teaches Drawing

Used in convalescent hospitals, the combination stereoscope-drawing board is helping returned veterans learn the first steps of commercial art or illustration.

► VETERANS recovering from war disabilities in government hospitals can relieve the boredom of slow convalescence by learning new skills and handicrafts. To the already familiar work in wood, metals, leather and textiles has now been added an opportunity to learn freehand sketching. Young men have a chance to take at least the first steps towards interesting jobs in magazine illustration, commercial art, or even full-fledged careers in portraiture and landscape painting.

Floyd V. Cornaby, specialist in vocational shop retraining in the Veterans Administration, believes there is a good deal of undiscovered art talent among the young veterans now in the hospitals.

To help them through the first and most discouraging steps in learning how to draw, a new device is now being tried out in veterans' hospitals. It aids the beginner in getting a feel of proportion and perspective, and shows him how to translate what he sees of a three-dimensional object into terms of lines on a two-dimensional sheet.

It has been given the trade name "Artiscope." The device is an ingenious combination of a stereoscope and a drawing-board. Into the stereoscope, which is mounted on a light metal frame above the board, the student puts natural color slides that come with the set. These give three-dimensional views of models, landscapes, still life groups—anything that an artist might want to draw. Looking into the stereoscope, the student sees his model projected into space as it would be in nature. A book of instructions tells all the essential tricks of the trade.

One great advantage of this device is that it can be used anywhere—on a table in the convalescent ward, on a board over the arms of a wheel-chair, even braced on a patient's lap in bed.

Another advantage is that actual models are not required, so that the student can make progress under the unavoidable limitations of life in a hospital. Neither does a teacher need to be constantly at the student's elbow; an occasional critique keeps him on the right track.

There is no magic in this kind of art instruction. The student is not making a mechanical copy; he has to employ what talent he has, and strive to improve it as he goes along.

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SAFETY

Caution, Science Aid In Preventing Fire

► HALF of America's destructive fires are in homes. For that reason the scientists have devoted much of their energy to the problem of making homes less of a fire hazard. They have developed wallboards for interior and exterior uses that have a high degree of fire resistance. Some contain glass fiber, some contain asbestos, others are of cement or plaster composition and contain non-combustible non-metallic minerals, and still others are made of some of the new heat-resistant plastics.

The National Bureau of Standards has found recently a chemical treatment by which lumber is made less combustible. In it the wood is impregnated with solutions of ammonium salts, borax or boric acid. The treatment may double the cost of the material but the process is worth while for lumber to be used where the fire hazard is high.

Well-painted surfaces are fire-resistant. The U. S. Navy, by experimentation, has found that if aluminum powder is added in the priming coat, the fire-retardant properties of the paint coating are improved. The practice is now followed on all interior painting in Navy ships.

There are many steps to decrease fire hazards that home-owners can take, scientists state. The fire danger may be from the outside or inside. Fire-resistant coverings on outer walls of a frame house, to lessen the danger from grass and other outside fires, are helpful. Good paint, particularly with the aluminum powder priming coat, is one. Asbestos siding, or covering of other noncombustible or slow-burning materials, is better. Slate, asbestos, or certain other special shingles will protect the roof from flying sparks.

Chimney construction should include a tile flue within the brick and mortar; brick and mortar alone crumble and leak with excessive heating.

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ARTISCOPE—Looking through the lenses of the stereoscope, the young veteran sees a three-dimensional image of the model projected into space. The nurse-instructress gives him hints.

MEDICINE

**High Blood Pressure,
Long Life Compatible**

► **YOU CAN HAVE** high blood pressure and live a long life, Dr. Hugh J. Morgan and Dr. Laurence A. Grossman, of Vanderbilt University School of Medicine, declared at the centennial celebration of the University of Buffalo.

Courage, serenity and optimism are the best medicines for the patient with high blood pressure, they believe.

They emphasized the importance of treating the patient, rather than the disease. In the vast majority of cases, they stated, the cause of the high blood pressure cannot be located and removed. Most students of the problem, they pointed out, are opposed to drugs prescribed specifically for reducing the blood pressure.

Drugs from potassium thiocyanate to extracts of mistletoe, garlic and watermelon seed are included in the ban because those which do lower the blood pressure are either poisonous when given continuously or have a passing effect and are not suited for prolonged use.

The doctors were equally unenthusiastic about diets, gland therapy and physiotherapy. Psychiatric treatment which aims at relieving tension and fears and developing confidence may help the patient live with his high blood pressure.

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ENGINEERING

**German Papers Aid
In Power Transmission**

► **GREAT DAMS** built by the United States for hydroelectric power plants, or others constructed for irrigation or flood control that produce electricity as a byproduct, can serve a much larger area by means of German developments.

German documents, now in America, outline procedures for transmitting power up to 500 miles over wires carrying 400,000 volts. Heretofore the maximum transmission was up to 300 miles, at 287,000 volts or less, officials of the Power Division of the U. S. Department of the Interior state.

These valuable documents were obtained by representatives of the Office of Technical Services, Department of Commerce, and now have been translated by the Interior Department. They indicate that Germany was far ahead of the United States in the development of

alternating and direct current 400,000-volt transmission lines, the Power Division declares.

The United States is using long-distance transmission with potentials up to 287,000 volts on the Boulder-Los Angeles line, a distance of some 250 to 300 miles. The Bonneville Power Administration, studying the problem of ultra high-voltage transmission since 1938, sees in the German system a solution by means of which large blocks of power can be sent to coastal and other communities 500 miles away. The Grand Coulee dam, also on the Columbia river, is located well within a 500-mile distance of much of the industrial northwest.

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GENERAL SCIENCE

**Pacific Scientific Outposts
To Be Living Memorials**

► **UNDER A PLAN** just announced, scientific outposts in the far-flung Pacific will become memorials to American fighting men who lost their lives in the Pacific area.

Dr. Dillon Ripley, Yale biologist, is leaving on a survey trip for the Pacific War Memorial Foundation to determine where the field stations for scientific research are most needed.

A national fund of \$10,000,000 will be sought by the Foundation under the presidency of Col. Archibald B. Roosevelt.

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CHEMISTRY

**Germans Used Sugar
For Making Glycerine**

► **AMERICAN** housewives saved fats to make the war-essential glycerine, but the Germans supplemented their supply by making glycerine from sugar.

This has come to light in postwar studies of German industries made on the spot by American investigators. The process is now revealed by the Office of Technical Services, U. S. Department of Commerce.

The sugar, in the German process, was first inverted in a weak solution of oxalic acid at approximately 75 degrees Centigrade, then neutralized with calcium carbonate. When the solids had settled, the solution was treated with charcoal and distilled. The resulting product contained about 40% glycerine, 40% propylene glycol, and 20% alcohols.

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IN SCIENCE

SAFETY

**Electric Warning System
Helps Control Fire**

► **ELECTRICAL** early-warning systems for use in homes and all types of buildings, trucks, buses and aircraft, give an audible signal or flash of a light if any of its heat-detecting elements scattered throughout the structure are heated much above normal atmospheric temperatures, indicating fire. Some are arranged to open valves on carbon-dioxide distribution lines to release the gas to extinguish the fire. It is a better and more sensitive system than the older automatic sprinkler type in which the heat of the fire melted or expanded a metal control, releasing piped water.

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METALLURGY

**Good Steel Made from
Low-Grade Iron Ores**

► **WHEN** America's high-grade iron ore is exhausted, which some predict may be within a few decades, domestic low-grade ores may be used to make excellent steels as a result of studies and experiments by the U. S. Bureau of Mines. The reserves of these low-grade iron ores are plentiful.

After 15 years' work on the problem, the Bureau now announces that it has found ways of producing pure metals from off-grade ores, and combining these metals to obtain steels and other ferrous alloys frequently superior to those made by standard methods from high-grade imported ores.

During these years, the Bureau has conducted studies in iron ore concentration, reducibility of ores and agglomerates, direct reduction of iron ores and concentrates by a wide variety of processes, special refining processes for iron, and the production of pure manganese, chromium and cobalt from low-grade ores by electrolytic processes. A special report gives many of the details. It may be obtained free from the Bureau. It is entitled "The Metallurgical Research Program of the Bureau of Mines Relating to Iron and Steel."

Science News Letter, October 12, 1946

NE FIELDS

PLASTICS

World-Round Flight Tests Plastic Packaging

► SOMETHING NEW in testing—a globe-circling jaunt—is about to start. The effectiveness of a plastic packaging of various products is being tested on a round-the-world flight.

The value of the plastic coating on the various materials will be tested under all the different kinds of climatic conditions encountered by a plane encircling the earth. The cargo includes machinery, airplane parts, fragile chinaware, precision instruments, medicals, blood plasma, bottled fruit juices, fresh eggs, and other hard-to-ship products. Handling properties will also be tested. The cargo is to be transferred eight times during its 25,000-mile trip.

The plastic is known as "Seal-Peel." It is applied by dipping into it the article to be packaged. When no longer needed, it can be peeled off. The coating applied can be of various thicknesses. It is claimed to protect against breakage, scratches, rust, corrosion, fungus growth, tampering and moisture penetration.

Science News Letter, October 12, 1946

DENDROLOGY

Second Stripping of Trees Yields American Cork

► AMERICAN-GROWN cork moved one step closer to becoming a full-fledged industry, with the stripping of more than 1,000 pounds of second-growth cork from trees in California, six years after the first, or virgin bark had been removed. This second-growth, or reproduction bark ranged between one and one-half inches in thickness and was of first-grade commercial quality.

The movement for the large-scale planting of cork-oaks in the United States, to supply at least a part of the nation's cork requirement, was established by the late Charles E. McManus, former president and chairman of the board of the Crown Cork and Seal Company in Baltimore, Md. Initiated more than six years ago in California, the cork project is active in 22 states today.

During the past six years more than 12 tons of virgin cork have been removed

from over 500 cork trees. All of this cork has been processed and manufactured into cork products for thorough testing. In every case the home-grown product was found equal to the imported material of the same grade.

In the same period some 18 tons of cork-oak acorns have been collected and distributed over the warmer half of the country. This outstanding progress in planting cork-oaks has been achieved through the effective cooperation of forestry specialists and agricultural advisers interested in tree culture. Thousands of little cork-oaks are now growing from coast to coast and thousands more are being planted each year.

Science News Letter, October 12, 1946

CHEMISTRY

Plasticizer Makes Resins Resistant to Water, Oil

► BETTER protection of cloth and clothing from water, machinery from corrosion, electric circuits from shorting, and improved automobile finishes, will result from the development of a new substance to add to resins now used.

The compound makes the resins more resistant to water, oil and abrasion. These properties suggest its use in coated textiles, shower curtains, hospital sheeting, shoe soles, electrical insulation, and packaging. It may be used in automobile and furniture lacquers to provide tough, abrasion-resistant finishes.

Technically, the new material is a plasticizer. It is a product of Monsanto Chemical Company, and has been given "Santicizer 160" as a trade name. It is designed especially for use in polyvinyl chloride, polyvinyl chloride-acetate and polyvinyl butyral resins, but imparts desirable qualities to a wide variety of resins.

Science News Letter, October 12, 1946

CHEMISTRY

New Process Prepares Sweet Fruit Syrups

► SWEET CONCENTRATED fruit syrups are prepared by first acidifying the pulp with phosphoric acid, then adding lime to obtain a dense precipitate, then re-acidifying, after which the clear juice is drawn off and concentrated by evaporating off excess water.

This process is covered by patent 2,408-418, obtained by A. M. Erickson of San Jose, Calif., and J. D. Ryan of Campbell, Calif.

Science News Letter, October 12, 1946

OCEANOGRAPHY

Piled-Up Ocean Water May Cause Baby Quakes

► OCEAN WATER piled up in the tormented vortices of hurricanes is suggested as the probable cause of the miniature earthquake waves called microseisms, by Dr. James B. Macelwane, S. J., director of the Institute of Geophysical Technology of St. Louis University.

Microseisms get their start in the earth's crust under the ocean bottom when the wide, whirling cyclone of a hurricane passes over.

The whirling sweep of the storm area, he points out, sets the ocean into whirling motion also. The water converges toward the center, piles up there above normal ocean level. It becomes lighter under the action of higher temperature, lower atmospheric pressure, and addition of fresh water from the pouring rain.

It cannot flow outward against the constant push of the intruding winds; there is nowhere to go but down, so down the lighter surface water goes.

But at the same point on the way down, it encounters water sufficiently dense to stop it—with a bump. This happens repeatedly, as the storm center travels along.

Science News Letter, October 12, 1946

INVENTION

Freight Containers Useful In Air Transportation

► FREIGHT containers, those handy box-like affairs for carrying less-than-carload shipments by rail, have now been adapted for use in air transportation. U. S. patent 2,407,774 has been issued to Harlan D. Fowler of San Diego, on what might be called a "flying flatcar," by analogy with the already familiar "flying boxcar" planes.

Except for the pilot's cabin forward, and a small compartment for mail and small-package shipments aft, the whole fuselage is simply a platform on which a row of pre-loaded containers can be set and secured. In an alternative design, a similar platform for freight containers can be arranged along the top of a giant flying boat, above the passenger deck. Provision is also made for refrigeration, by mechanical means or with dry-ice, for planes that need to spend time on the ground in hot climates.

Science News Letter, October 12, 1946

AGRICULTURE

D-D Saves Crops From Foes

New soil fumigant routs root-ruining nematode worms from fields producing everything from potatoes to pineapples; yield increases up to 200% reported.

By **BLAKE CLARK**

(For earlier reports on use of D-D, see SNL, April 22, 1943, and Nov. 10, 1945.)

► "THE NEW SOIL fumigants bid fair to become one of the greatest boons to agriculture since the development of fertilizer," announces Dr. Robert M. Salter, Chief of the Bureau of Plant Industry, which is a hard-headed division of the United States Department of Agriculture, not given to wild or loose talk. "The proper use of these new chemicals will bring increased crop yields all over the world."

Two million acres of land lying idle in the southern United States can now be brought back to profitable cultivation. Certain highly profitable crops which at present must be rotated every two or three years can be planted year after year on the same land. Truck farmers in various regions can reasonably expect from 20 to 200 percent larger crops, and thousands of home gardeners will discover that after all they, too, have green thumbs.

Scientific Protection

The scientific farmer learned long ago how to protect vines and fruit from insects and pests attacking above the soil, but he carried on a losing fight with the teeming trillions of pests lurking underground. The most virulent of these are nematodes—burrowing, eel-like worms 1/64 to 1/25 of an inch long—one of the farmer's worst enemies. He knows them as wire worms, round worms, eel worms, but has never known how to fight them effectively. One species causes root-knot, gnarling and stunting the roots of plants until they cannot absorb nourishment from the soil. It is known to attack 1500 plant species including tomatoes and the cabbage family. Another, the citrus nematode, causes a slow decline of orange, lemon and grapefruit yields and necessitates uprooting and replanting groves after 14 or 15 years. The meadow nematodes feast upon the farmer's corn, peanuts and tobacco. With a keen sense for

the best food values and vitamins, they burrow just under the skin of potatoes and ruin them. Species of this group are the worst pests of the nurseryman, attacking some of his most valuable ornamental plants, particularly boxwood. The florist curses them. The amateur flower gardener mourns his blasted China asters and snapdragons.

Nematodes are the common bane of the Asiatic rice farmer, the European sugar beet grower, the Java rubber producer, the India tea planter and the English, Danish and Irish potato farmer. They have been found in ocean depths, on mountain peaks, inside the Arctic Circle.

So serious had nematode infestation become by 1940 that it threatened to destroy the Hawaiian pineapple industry, which would spell ruin to the islands. Planters called upon a stocky, carrot-topped entomologist named Dr. Walter Carter to help them in their plight.

Carter once before had almost single-handedly saved the pineapple industry from extinction, by discovering the cause

of a devastating wilt and the remedy for it.

"It isn't a 'bug-sleuthing' job this time," he said. "At least we know and can see the villain. Nematodes are least damaging in virgin soil. Evidently we must do the impossible—restore virginity."

In early experiments, chloropicrin—tear gas—was shot into the soil. It killed the noxious organisms but it was tricky to handle and expensive.

Dr. Carter began a search for an inexpensive soil fumigant that would do the job. He asked a number of chemical companies for samples of by-product waste materials. Scores of bottles, drums, cans and steel cylinders piled in from the synthetic rubber, petroleum, coal tar and gasoline industries. Carter and his assistants took them to the fields at Wahiawa and measured them out on 20 different plots. Each chemical was tested from four to six times. Not one gave encouraging results.

D-D Development

Then came one from the Shell Chemical Corporation in California. A by-product of allyl-chloride, used in making plastics, it showed up well in the preliminary trials. Dr. Carter tried it out on a larger plot. Every 15 inches he punched a hole in the ground and poured in a fraction of an ounce of the dark-colored liquid. It spread through the soil like coffee through a lump of sugar. Fumes shot out in a circle, killing every worm they reached. Grimly pleased, Carter dubbed it D-D, because its chief components are dichloropropane and dichloropropene.

Dr. Carter tested D-D on 840 plots on 14 different plantations throughout the islands over the next two years. Treated and untreated plots, side by side, would look just alike for months. But by harvest time untreated squares of the checkerboard had blotchy, stunted plants. Treated plots were covered with healthy plants of towering broad, live-green leaves from the center of which grew giant-sized, golden yellow pineapples. Equally important, Carter found that the land could be replanted that same season.

The pineapple company ordered all the D-D it could get—125 tons—and shot it into 1250 acres. These fields, which had yielded from 12 to 30 tons of fruit



ROOT-KNOTS—This potato is diseased with the root knot nematode. Courtesy of the Division of Nematology, Bureau of Plant Industry, Soil, Agricultural Engineering.



INJECTOR—Applicator of Shell Chemical Corp. used for treating land at Weatherford Farms, Linn, Texas. Photo by R. A. Biron, Dow Chemical Co.

per acre, now yielded on the average 40 tons increasing cash yield, growers estimated, by \$250 an acre. On 50,000 acres that adds up. If scientists worked on commission, Walter Carter would be one of the world's wealthiest men.

The news was hailed with great excitement by truck farmers in California, where nematodes seriously damage the crops on 65 percent of the arable land. Field tests were conducted in the sandy soil at Atwater, in Merced County, badly infested. Untreated plots of snap beans died, yielding nothing. Plots treated with D-D bore a heavy crop. Tomato vines in unfumigated areas yielded five or six prune-sized fruit and then died; in D-D dosed plots each plant bore a bushel of tomatoes.

Other Effective Fumigation

In Los Angeles county, where root-knot usually malformed and stunted carrots until more than half were unmarketable, fumigation was so effective that 95 percent of the carrots were perfect. A rancher in Ventura used to grow 816 pounds of sweet potatoes per acre. Fumigation boosted his yield to 13,860 pounds. In another county, where 75,000 to 85,000 acres of the best land crawls with the worms, D-D multiplied yields of lettuce eight times. All over the state, growers of lima beans, squash, Irish potatoes and beets obtained similarly astounding increases in yield and quality.

Sugar beet growers' fields are infested with nematodes. They force expensive rotation; replanting is unprofitable for three years. At Midvale, Utah, the Amalgamated Sugar Company planted soil that it would normally have left idle. The company found to its gratification that on this sick land, D-D increased

beet yields from 3.71 to 17.7 tons per acre.

Certain nematodes relish tobacco. Shade-grown tobacco is the most expensive in the world—partly because the tiny worms make it necessary to put up cheesecloth shade over fresh land every year. This spring, growers at Quincy, Florida, treated the fields with D-D and replanted. To their surprise, yields greatly surpassed those on virgin fields.

Peaches will not grow profitably on thousands of nematode-infested land in the South. Dr. Gotthold Steiner, principal nematologist of the Bureau of Plant Industry, had an experimental orchard planted at Tifton, Ga. At the first fruiting, from the trees in one area, he picked ten times as many peaches as from the unfumigated trees.

One of the worst potato pests in the world is the golden nematode, an especially tough species which for more than 20 years has plagued the farmers of Ireland, England, Scotland, Denmark, Sweden and Germany. In some areas only one profitable potato crop can be grown every five or six years. In Sweden and northern Ireland the government took infested lands out of production to prevent spread of contamination. In Germany, rotation was prescribed by law and controlled by police. Imports of potatoes from diseased regions were prohibited.

In 1941 Charles Gellweiler, of Hicksville, Long Island, complained to his county agricultural agent of decreasing potato yields. Tests proved the dreaded golden nematode had arrived. Thoroughly alarmed, the Department of Agriculture surveyed the potato growing regions of 19 northern states. It was discovered that the infestation was restricted to some 1500 acres near Hicksville. These are now quarantined while an intensive program of complete nematode

eradication is carried out.

Results already obtained offer tremendous hope to European potato farmers. D-D has proven up to 99.9 percent effective. Yields in treated areas have risen more than 75 percent.

Preliminary surveys indicate that about 80 percent of the arable land in Florida, Mississippi, Louisiana, Texas, New Mexico and Arizona is nematode infested, and more than 60 percent of that in Washington, Oregon and Idaho. Half the counties of the mid-western states show some infestation. The worms do not multiply so rapidly in the cooler areas, but they are quite capable of doing serious damage as far north as New York, as the Long Island experience shows.

The home gardener can fumigate a 2000-square-foot plot for \$5.64. The only equipment he needs is a sharp stick and a teaspoon. He prepares the soil to good tilth and pours in the D-D, taking care as with any chemical not to spill it upon his hands or clothes. Since it is toxic to living plants, he waits two weeks before putting in his crop so that all fumes can escape from the soil. The farmer who has too much acreage to fumigate by hand uses a portable applicator or a small machine. Big operators have their own specially built tractor-drawn machines



CHECKERBOARD—Plot marked for treatment by spot injections with hand applicator. Stakes mark the spot where injections are made. Photo by A. L. Taylor, Division of Nematology, Bureau of Plant Industry, Soil, Agricultural Engineering.

Do You Know?

The human body contains enough phosphorus to make 2,200 matches.

Cases of *mastitis*, costly disease of dairy cows, can be checked effectively with penicillin.

Schoolrooms can be made considerably lighter by using, instead of blackboards, white glass *chalkboards*, on which blue chalk is used.

Tungsten for use in high-grade light bulbs must be 99.99% pure; refined from ore, it is pressed into bars, and drawn into strands one-fifth the diameter of human hair.

Despite restrictions on use of grains, this year's production of American *beer* has been running at an annual rate of about 70,000,000 barrels, as contrasted with prewar production of about 55,000,000 barrels.

ARISTO CHRONOGRAPHS



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which feed a thin stream of the liquid through small pipes running down behind narrow plow points.

Two firms in California are doing a land-office business fumigating by contract. Starting in the south, they go straight up-state, spreading D-D at \$40 an acre, doing sometimes 20 acres a day. Still the market in the United States had hardly been tapped.

Soil fumigant already is being shipped to Puerto Rico, South Africa, New Zealand and England. Dow Chemical Company and Innis, Speiden Company have brands on the market competing with D-D. As present prices continue to drop with increased production, fumigants can be used profitably by growers of virtually every crop—even cotton, corn and wheat—raised in affected areas. Manufacture is a simple process, and present production of some 10,000 tons a year can be expanded almost overnight.

Gardeners in Florida and California obtain the liquid chemical from their local seed stores. Manufacturers promise

that by spring it will be packaged and on the shelves of dealers in all areas where it is needed. The man who is already enjoying good crops or whose land is unfertile may not find fumigation profitable, although over and above pest control it has given definite evidence of plant stimulation similar to a shot of nitrogen in the soil. Certainly if he has poor crops he will do well to uproot samples and take them to his county agent for inspection. "I thought I'd been planting when the moon was too full," one Florida farmer said, "but it was the ground that was too full—of that dratted worm."

It is imperative that we produce large quantities of food for years to come despite limited farm labor and equipment. It is essential that the most efficient use be made of all arable land. General use of the new soil fumigants should more than double our present production of most vegetables and some fruits on land now infested with nematodes, and thus help fill the horn of plenty for ourselves and for our world neighbors.

Science News Letter, October 12, 1946

ENGINEERING

Waste Products Find Use

➤ MOLDED BOARDS of softwood shavings from a planing mill can be produced at a price which can compete with plywood or lumber in certain instances, the American Society of Mechanical Engineers was told by Robert A. Caughey of the Souhegan Mills, Wilton, N. H. These shavings are now largely a waste product.

By the use of the proper amount and type of resin as a binder, and by curing under proper conditions of temperature and pressure, he said, it is possible to obtain a molded product which has very high resistance to water, very high strength and hardness, and which is eminently suitable for a wide variety of applications. Sawdust and other wood wastes can also be used to make lumber substitutes.

Mr. Caughey reviewed many of the new processes for using wood wastes in making plastics, or fillers in plastics. He called attention to the present tremendous wastage in connection with lumbering and woodworking industries. The wood wastes in terms of pounds of material, he declared, amount to at least 80% of the salable material produced, and this does not include the logging waste left in the woods.

The industry to which the waste wood

situation presents the greatest challenge, he asserted, is the plastics industry. The wood in the form of waste is still sound material with its original basic properties of strength and chemical resistance. The only disadvantage lies in its form, it being generally in such small pieces that it cannot be worked up into any usable product. It therefore remains to convert these particles into large pieces of some practical value.

Science News Letter, October 12, 1946

INVENTION

Plastic Coating Makes Better Work Gloves

➤ WORK GLOVES, made of plastic-coated fabrics, are promised for the near future. Much of the glove is Canton flannel, but the thumb, index finger and palm-surface are covered with vinyl butyral, a tough, flexible plastic made by the Monsanto Chemical Company, that gives protection similar to leather.

The plastic coating is washable. Grease, oil and grime can be removed with a solvent. The gloves will be made by regular glove manufacturers, Monsanto furnishing the plastic. This coating material has good wearing qualities.

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Motor transportation makes it possible for thousands of communities to grow in remote sections of the country. Built along the nation's highways, they depend entirely upon trucks, buses, automobiles and airplanes to maintain physical contact with the rest of the world.

Towns are built on gasoline

OVER FIFTY-FOUR thousand communities in the United States are entirely dependent on gasoline transportation—and there is not a town anywhere which does not depend upon it to some degree. And it would be hard to find a man, woman or child—or a business or an industry—that does not benefit each time the cost of automotive transportation is reduced.

During the past twenty years such reductions have been many. For one thing, gasoline costs less today than it did in 1926. And by producing increasingly better gasoline over the years, through improved refining methods and the use of Ethyl antiknock fluid, refiners have paved the way for the development of more powerful engines that provide better transportation at lower cost.

If tomorrow's cars, trucks and buses are to be even more efficient than they are today, they will be made that way by designing engines that can take

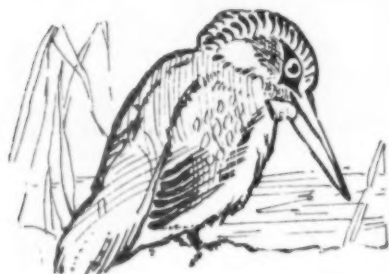
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Halcyon Days

► "HALCYON DAYS" is an expression we are very likely to hear about now, whenever a spell of calm, warm, "Indian summer" days makes us forget for a while summer storms that are past and winter weather that is still to come. Most of us do not stop to think of its origin.

The phrase dates back to a belief of the ancient Greeks, that during calm, bright days that sometimes intervene in the midst of the Mediterranean winter a bird called the halcyon, usually identified as the kingfisher, made a floating nest on the quiet waters and there reared its young. The word "halcyon" itself is a combination of two Greek roots mean-

ing "seaborn." Many old-time superstitions have survived into our own time, but this one has died out completely, leaving only its name as a literary tag.

There is reason enough for supposing that the kingfisher actually was the halcyon of the ancient Greeks. It is of necessity a water-side dweller, and thus would have been familiar to sailors and especially to fishermen. The latter may well have admired its skill at their own craft. It is quite unlikely that the Greeks, who were on the whole not very observant naturalists, would have noticed the kingfisher's habit of occasionally vanishing into a hole in an earthen bank or bluff, so that the whereabouts of its nest remained a mystery. And where facts do not presently come to hand to explain a mystery, a superstition is very likely to take their place. Hence the story of the floating nest.

There was another superstition about the kingfisher, that apparently survived at least into the Renaissance. Sailors believed that a reliable wind-vane could be made by hanging up a dead kingfisher by the neck: its long beak was supposed to point steadily into the wind. Marlow, a contemporary of Shakespeare, alludes to this in one of his plays: "Into what quarter peers my halcyon's bill?" Whether sailors actually did use dead kingfishers for this purpose may be doubted. Kingfishers aren't easy to catch; and anyway sailors usually have better means for telling wind direction. Perhaps the belief only survived the better because everybody held it and nobody put it to the test.

Science News Letter, October 12, 1946

YOUR HAIR AND ITS CARE

By O. L. Levin, M. D. and H. T. Behrman, M. D.

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CHEMISTRY

Series of New Glucose Compounds Is Developed

► A WHOLE series of new compounds made of glucose and other simple sugars has been developed by William C. Griffin of Tamaqua, Pa., assignor to the Atlas Powder Company. The sugar is mixed with one of the glycols and heated mildly in the presence of a little sulfuric or other strong acid. The resultant compound is viscous, sticky and hygroscopic. It can be used as an adhesive or as a conditioner for such diverse things as synthetic sheeting, tobacco and gelatine products. Three patents cover this invention, nos. 2,407,001 to 2,407,003.

Science News Letter, October 12, 1946

PHYSIOLOGY

Growth Factor Research Leads to Treatments

► WATCH FOR new treatments of disease and better understanding of human ills to come from inquiries into about 20 mysterious vitamins and growth factors.

The Princeton Bicentennial Conference on growth received from Dr. Karl Folkers, Merck research director, a list of unidentified food factors that are additional to the ones that you read about or take in pills.

Latest of these include an antistiffness factor that shows up in guinea pigs, an unnamed feeding factor needed by chicks, and unrecognized vitamins that pigs must have.

One of the most recently discovered vitamins that has been put to use is folic acid. It formerly was thought to be something that only bugs needed. Then it was discovered that it plays an important role in warding off many kinds of anemia.

Scientists now expect that other little-understood food factors will turn out to be necessary for well-being or useful in treating disease.

Science News Letter, October 12, 1946

CHEMISTRY

New Treatment Lessens Fire Hazard in Lumber

► FIRE HAZARD in lumber construction can be lessened materially by chemical treatment, impregnating the timber with solutions of ammonium salts, borax, or boric acid, the National Bureau of Standards finds in recent tests. In fire-tube tests, treated wood lost an average of 40% and untreated wood lost 80% of their weights.

The added expense of chemical treatment, the Bureau states, may double the cost of the lumber. This tends to limit its use to applications where there is a special fire hazard.

In the Bureau investigation, eight solid walls of select Douglas fir lumber were subjected to fire endurance tests, four loaded and four unloaded. The chemical treatment added 17% to 23% to the failure time of treated walls under load in contrast to the untreated walls. For the walls without load, the treatment increased the failure time from 29% to 33%.

Science News Letter, October 12, 1946

Books of the Week

THE COMING AIR AGE—Reginald Cleveland and Leslie Neville—*Whitlessey House*, 359 p., illus., and diagrs., \$2.75. This book blueprints tomorrow's aviation world. It is a simple, definite outline of the steps by which aviation will approach its real maturity as a power for peace.

THE ENDEAVOUR OF JEAN FERNEL with a List of the Editions of his Writings—Sir Charles Sherrington—*Cambridge Univ. Press*, 223 p., illus., \$3.50. This book is a study of the sixteenth-century French physician. The notes to the text include an English translation of Plancy's *LIFE*, and biographical notes of persons named.

FLUORESCENT LIGHTING—A. D. S. Atkinson—*Chemical Pub. Co.*, 144 p., illus., diagrs., and tables, \$3.50. Full details of the construction and operation of all types of fluorescent lighting are given and the application of fluorescent lamps in factories, public buildings, domestic interiors, etc., is discussed and illustrated.

GREENHOUSES: Their Construction and Equipment—W. J. Wright—*Orange Judd Pub. Co.*, 269 p., illus., diagrs., and tables, \$2.50. A text book giving definite, concise information about the different forms of construction, heating and equipment and probable cost of greenhouses. Conservatories, hotbeds and cold frames, forcing houses and pits all receive full and detailed treatment.

HEAT TREATMENT OF CARBON STEELS—F. Johnson—*Chemical Pub. Co.*, 204 p., illus., diagrs., and tables, \$4.00. A book that deals almost exclusively with carbon-steels. Although a knowledge of the principles of physical metallurgy will be an advantage, it is hoped that readers not possessing such knowledge will be able to profit from a study of the material in this volume.

WHAT INDUSTRY OWES TO CHEMICAL SCIENCE—Based on a scheme by Richard B. Pilcher and Frank Butler-Jones with Fifty Contributors—*Chemical Pub. Co.*, 372 p., \$5.00. A book that is intended for the general reader as well as for chemical students. The authors, in supplying definite evidence in concrete form of the

utility of chemistry in the development of industry, have endeavored to avoid technical details.

THE LEGEND OF KING KERET: A Canaanite Epic of the Bronze Age—H. L. Ginsberg—*American Schools of Oriental Research*, 50 p., plates, paper, \$1.25. Supplementary studies Nos. 2-3.

NARCOTICS AND DRUG ADDICTION—Erich Hesse, M.D.—*Philosophical Library*, 219 p., tables and diagrs., \$3.75. A complete and up-to-date handbook, describing the uses and abuses, in the Eastern and Western world, of all the pleasure drugs and stimulants.

RADIO IS YOURS—Jerome Spingarn—*Public Affairs Committee*, 31 p., diagrs. and tables, paper, 10 cents. This pamphlet urges citizens to keep informed on all matters which affect the control of the channels of mass communication, to discuss communication problems with others, and to participate as much as possible in the regulatory process, in order to get their money's worth in radio programs. *Public Affairs Pamphlet No. 121.*

STANDARD PRACTICES FOR STATIONARY DIESEL ENGINES—*Diesel Engine Manufacturers Assoc.*, 157 p., illus., diagrs., graphs, and tables, \$2.50. This book covers stationary Diesel engines at speeds up to and including approximately 750 revolutions per minute, and supersedes all previous editions of these standards. It will be of service to Diesel engine users, prospective buyers and consulting engineers.

THE VALLEY OF OIL—Harry Botsford—*Hastings House*, 278 p., illus., \$3.00. A vivid chronicle of the early growth of the world's first commercial oil enterprises and the pioneers in Pennsylvania who made the industry what it is today.

THE WINGED SERPENT: An anthology of American Indian Prose and Poetry—Margot Astrov, Ed.—*Day*, 366 p., \$3.50. An anthology which presents the American Indian as an outstanding poet, as a singer of exquisite songs, maker of sublime prayers or dangerous spells, and judicious teller of tales and mythic stories.

Science News Letter, October 12, 1946

show that it can be made a part of various breads and cookies.

When fed to young laboratory animals as the source of the protein in the diet, wheat and corn germs showed considerable power to aid normal growth, Dr. David Breese Jones and co-workers of the Department found. In their studies young rats were put on diets in which the source of protein differed. Some got wheat germ, some corn germ. Others were fed soybean, peanut or cotton seed flour. Still others were given animal protein such as dry skim milk, casein, and dried whole egg.

Of all the plant proteins, the wheat and corn germs did the best for the young animals as shown by their growth.

Science News Letter, October 12, 1946

CHEMISTRY

New Method Extracts Aluminum from Ores

► A METHOD for extracting aluminum from low-grade ores, clays, etc., is covered by patent 2,408,241, issued to Lucien C. Sturbells. Essential parts of the process are fusing the ore with carbon in an electric furnace, then leaching the alumina out of the resulting slag with sodium carbonate. Further purification and extraction of aluminum from the alumina follow more or less conventional lines.

Science News Letter, October 12, 1946



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NUTRITION

Grains Supply Protein

► GOOD NEWS for housewives worried about how to feed their families enough protein when meat is scarce or too expensive for the food budget comes in a report from the U. S. Department of Agriculture.

Germs of wheat and corn may come close to doing as efficient a job of tissue building as would be expected from eggs, milk, meat and other foods of animal origin which have long been recognized as sources of highly efficient protein.

These germs are not, of course, disease germs that make you sick. They are the

tiny parts of the wheat or corn seeds from which new plants sprout. Wheat germ, which is flattened and sifted out in the milling of patent flour, comes out as a yellowish oily flake with a pleasing nutty flavor, Department of Agriculture officials point out. A defatted wheat germ, which keeps better than the fatty flake, is now being prepared.

It requires no cooking and can be added to cereal at serving time. It adds not only protein but B vitamins as well. Tests in the experimental cookery laboratories of the Department's Bureau of Human Nutrition and Home Economics

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•New Machines And Gadgets•

❁ **AUTO bottle warmer**, plugged into dashboard socket, heats baby's formula in about eight minutes, without interrupting trip. The heating unit, sealed in pyrex glass tube and topped with surgical rubber cap, is sterilized beforehand. Five ice cubes placed in an insulated container keep formula cool until feeding time.

Science News Letter, October 12, 1946

❁ **MIDGET storage batteries** of four cells, each about the size of a candy bar, supply power to radio transmitters carried to high altitudes with sensitive weather instruments by hydrogen-filled balloons. The transmitters send continuous reports to the earth. The lead-acid batteries come dry; the acid enters the cell through a puncture made just before it is needed.

Science News Letter, October 12, 1946

❁ **CELLOPHANE FILM** of unusual thinness, developed in Holland, is responsible for a new method of photochemical photography. In making, cellophane film is immersed in a solution of diazonium and mercury salts. Developing and printing can be done in sodium light because the sensitiveness to light of diazonium is limited to violet and ultraviolet rays.

Science News Letter, October 12, 1946

❁ **HEAT DETECTOR**, sensitive to the heat in a man's body in the darkness a quarter of a mile away, collects the invisible heat waves by a parabolic reflector, within the instrument shown in the picture. It focuses them on a thermal resistor which changes the electrical cur-



rent passing through it as the heat varies.

Science News Letter, October 12, 1946

❁ **GARDEN TOOL** plows, harrows and pulverizes the soil in one operation. The power-driven machine, guided by handlebars, has a rotating cylinder close to the ground which has many long, sharp, hooked teeth on its surface. These cut downward in front of the cylinder, dig to the proper depth and raise the pulverized soil to the rear.

Science News Letter, October 12, 1946

❁ **METAL CANS** for fruit and vegetable preservation are made with slightly tapering sides so that they can be "nest-

ed" in shipping and storage, occupying much less space and preventing dents. When filled and sealed, they require no extra space in shipping cases if alternate cans are placed bottoms up.

Science News Letter, October 12, 1946

❁ **TREE PROTECTOR**, which prevents insect and other damage to fruit, is a pair of frames, raised on each side of the tree, that lock together at the top. Their spreading legs, surrounding the tree, support a fabric covering that is pulled in sections to the top by means of attached pulleys and cords.

Science News Letter, October 12, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 332. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

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Question Box

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